

CLAIMS

1. A method of encoding an input signal into an output bit stream (BS), said input signal comprising blocks of values, said method comprising the steps of:
 - 5 – applying (1) a transformation to a block of values (BV) in order to get a transformed block (TB), said transformed block comprising a number (I) of coefficients, said number being greater than one,
 - scanning (2) the coefficients (C_1 - C_I) of a transformed block (TB) according to a coefficient scanning order,
 - 10 – splitting (3) a scanned coefficient (C_i) into K groups of bits ($C_{i,1}$ - $C_{i,K}$) numbered from 1 to K, such that at least a group of bits comprise at least 2 bits and such that said scanned coefficient (C_i) is the concatenation of the K groups of bits,
 - entropy coding (4) a k^{th} group of bits ($C_{i,k}$) using entropy codes into a k^{th} entropy coded group of bits ($EC_{i,k}$),
 - 15 – forming (5) a block bit stream (BBS) from the K entropy coded groups of bits of the scanned coefficients of the transformed block, said output bit stream (BS) comprising said block bit stream (BBS).
2. A method of encoding a signal as claimed in claim 1, wherein said entropy codes are
20 Variable Length Codes.
3. A method of encoding a signal as claimed in claim 1, wherein the K entropy coded groups of bits ($EC_{i,1}$ - $EC_{i,k}$) of the scanned coefficient C_i are grouped together to form an entropy coded coefficient (EC_i) and said block bit stream (BBS) comprises a
25 concatenation of said entropy coded coefficients.
4. A method of encoding a signal as claimed in claim 1, wherein said block bit stream (BBS) comprises K entropy coded block layers (EBL_1 - EBL_K), a k^{th} entropy coded block layer (EBL_k) comprising the entropy codes of the k^{th} groups of bits of the I
30 scanned coefficients of the transformed block (TB).
5. A method of encoding a signal as claimed in claim 4, wherein said output bit stream (BS) comprises K layers (L_1 - L_K), a layer (L_k) comprising a concatenation of the k^{th}

entropy coded block layers (EBL_k) corresponding to successively scanned blocks of values of the input signal.

- 5 6. A method of decoding a bit stream (BS) comprising block bit streams into a decoded signal, a block bit stream (BBS) comprising entropy coded coefficients (EC_i), said entropy coded coefficients comprising entropy coded groups of bits ($EC_{i,1}$ - $EC_{i,K}$), said method comprising steps of:
 - entropy decoding (12) said entropy coded groups of bits ($EC_{i,1}$ - $EC_{i,K}$) into entropy
10 decoded groups of bits ($DC_{i,1}$ - $DC_{i,K}$),
 - grouping (13) said entropy decoded groups of bits ($DC_{i,1}$ - $DC_{i,K}$) into a decoded coefficient (DC_i),
 - inversely scanning (14) said decoded coefficients (DC_1 - DC_I) to form a decoded transformed block (DTB),
 - 15 – applying (15) an inverse transformation to said decoded transformed block (DTB) in order to get a decoded block (DB), said decoded signal comprising decoded blocks.
7. A method of decoding a plurality of entropy coded block layers (EBL_1 - EBL_K) into a decoded signal, said method comprising steps of:
 - 20 – entropy decoding a k^{th} entropy coded block layer (EBL_k) into a k^{th} entropy decoded block layer (DBL_k), said k^{th} entropy decoded block layer comprising k^{th} decoded groups of bits ($DC_{i,k}$),
 - grouping first to K^{th} decoded groups of bits, in order to form decoded coefficients (DC_i),
 - 25 – inversely scanning (14) said decoded coefficients (DC_1 - DC_I) to form a decoded transformed block (DTB),
 - applying an inverse transformation to decoded transformed block (DTB) in order to get a decoded block (DB), said decoded signal comprising decoded blocks.
- 30 8. A video encoder for encoding a sequence of images, said images comprising blocks, said video encoder comprising means for:

- applying a transformation to a block of values (BV) in order to get a transformed block (TB), said transformed block comprising a number (I) of coefficients, said number (I) being greater than one,
- scanning the coefficients (C_1 - C_I) of a transformed block (TB) according to a coefficient scanning order, a scanned coefficient (C_i) comprising a number (N) of bits, said number (N) being greater than one,
- splitting a scanned coefficient (C_i) into a number (K) groups of bits ($C_{i,1}$ - $C_{i,K}$) numbered from 1 to K, said number (K) being greater than one, such that at least a group of bits comprises at least 2 bits and such that said scanned coefficient (C_i) is the concatenation of the K groups of bits,
- encoding said k^{th} groups of bits into k^{th} entropy coded groups of bits ($EC_{i,1}$ - $EC_{i,K}$) using entropy codes.
- forming a block bit stream (BBS) from the entropy codes, said bit stream (BS) comprising said block bit stream (BBS).

9. A video decoder for delivering a sequence of decoded images by decoding a bit stream (BS) comprising block bit streams, said block bit stream (BBS) comprising entropy coded coefficients (EC_i) comprising a number (K) of entropy coded groups of bits ($EC_{i,1}$ - $EC_{i,K}$), said method comprising steps of:

- entropy decoding (30) said entropy-coded groups of bits ($EC_{i,1}$ - $EC_{i,K}$) into entropy decoded groups of bits ($DC_{i,1}$ - $DC_{i,K}$), said entropy decoded groups of bits forming decoded coefficients (DC_i),
- grouping (31) first to K^{th} decoded groups of bits, in order to form decoded coefficients (DC_i),
- inversely scanning (32) said decoded coefficients (DC_1 - DC_I) to form a decoded transformed block (DTB),
- applying an inverse transformation (33) to said decoded transformed block (DTB) in order to get a decoded block (DB), said decoded image comprising said decoded block.

10. A video decoder as claimed in claim 9, wherein said K received entropy coded groups of bits ($EC_{i,1}$ - $EC_{i,K}$) are decoded by K parallel decoding means.

11. A video trans-coder for trans-coding a first bit stream (BS₁) into a second bit stream (BS₂), said first bit stream (BS₁) comprising first block bit streams, a first block bit stream (BBS₁) comprising entropy coded first transformation coefficients (T₁C_i), said
5 video trans-coder comprising means for:

- decoding (40) said entropy coded first transformation coefficients into entropy decoded first transformation coefficients (DC_i),
- inversely scanning (41) said decoded coefficients (DC₁-DC_I) to form a decoded transformed block (DTB'),
- 10 – applying (42) an inverse first transformation to the entropy decoded first transformation coefficients in order to get a decoded block (DB''),
- applying (43) a second transformation to said decoded block (DTB) in order to get second transformation coefficients (C_i), a second transformation coefficient comprising N bits,
- 15 – splitting (44) said second transformation coefficient (C_i) into K groups of bits numbered from 1 to K, such that at least one group of bits comprises at least 2 bits and such that said second transformation coefficient is obtained by concatenating the K groups of bits,
- entropy coding (45) said kth groups of bits using entropy codes,
- 20 – forming said second block bit stream (BBS₂) from the entropy codes, said second bit stream (BS₂) comprising said second block bit stream (BBS₂).
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12. A computer program comprising a set of instructions which, when loaded into a
25 processor or a computer, causes the processor or the computer to carry out the method as claimed in Claim 1.

13. A signal carrying a program as claimed in claim 12.